Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A single-wavelength distributed feedback (DFB) laser structure having two sections, comprising:

an active-material layer for generating a laser light having a wavelength in a specific range;

two cladding layers respectively covering an upper and a bottom sides of said active-material layer for forming a waveguide structure;

a phase shift layer having a specific thickness for controlling a difference between Bragg wavelengths of said two sections;

a grating layer having a specific period for determining an illuminating wavelength;

a wet-etching stop layer positioned between said active-material layer and said ~~phase shift~~ grating layer[;], ~~and~~ wherein said wet-etching stop layer and said grating layer cooperate with each other for controlling a coupling index of said grating layer; and

~~a grating layer having a specific period for determining an illuminating wavelength,~~

another wet-etching stop layer positioned between said phase shift layer and said grating layer,

wherein a difference between said two sections is an existence of said phase shift layer thereon, and said existence of said phase shift layer causes a difference of the effective refractive indices between said two sections so as to generate a fixed difference between Bragg wavelengths of said two sections.

2. (Original) The laser structure according to claim 1 wherein said laser is fabricated on a same wafer.

3. (Original) The laser structure according to claim 1 wherein said active-material layer and said two cladding layers are formed through a single expitaxial growth step.

4. (Original) The laser structure according to claim 1 wherein said active-material is a multiple quantum well (MQW) layer.

5. (Original) The laser structure according to claim 1 wherein said two cladding layers are separate confinement heterostructure layers.

6. (Original) The laser structure according to claim 1 wherein said grating layer is formed on said laser by cooperating a single holographic exposure with a dry etching or a wet etching.

7. (Original) The laser structure according to claim 6 wherein before said grating layer is formed by said holographic exposure, a portion of said phase shift layer on one of said two sections is removed by said wet etching.

8. (Original) The laser structure according to claim 7 wherein said section having said phase shift layer thereon is named as a thick section, and the section without said phase shift layer being positioned thereon is named as a thin section.

9. (Original) The laser structure according to claim 8 wherein said thick section and said thin section with different or identical lengths are combined at an arbitray sequence in said laser structure.

10. (Original) The laser structure according to claim 1 wherein said two sections have different longitudinal lengths for forming a structural asymmetry, and when said fixed difference is getting larger, said asymmetry is getting larger.

11. (Original) The laser structure according to claim 1 wherein said laser structure has an anti-reflection layer on two end-facets thereof for avoiding a mode stability being influenced by a reflection.

12. (Canceled)

13. (Original) The laser structure according to claim 1 wherein said grating layer is located below said active-material layer so that said phase shift layer is located between said grating layer and said active-material layer, and apportion of said phase shift layer located on one of said two sections is removed before growing said active-material layer.

14. (Original) The laser structure according to claim 1 wherein said grating layer is located above said active-material layer so that said phase shift layer is located above said grating layer.

15. (Original) The laser structure according to claim 1 wherein said laser structure has coatings on two end-facets thereof for providing a proper reflecton so as to alter a performance thereof.

16. (Original) The laser structure according to claim 1 wherein said laser structure has asymmetric thin film coatings at two end-facets thereof for further destroying a mode symmetry, and because a mode-selection of said laser structure is influenced and said illuminating wavelength is randomly arranged at long wavelength mode or a low wavelength mode, a variation of said wavelength is approximately equal to a width of the stop-band.

17. (Original) The laser structure according to claim 1 further comprising two electrodes applied on said two sections for altering a phase relationship between said two sections so as to stabilize an output mode of said laser structure through adjusting a current of said two electrodes.

18. (Original) The laser structure according to claim 1 further comprising two electrodes applied on said two sections for altering an output wavelength of said laser structure so as to form tunable laser through adjusting a current of said two electrodes.

19. (Currently amended) A single-wavelength distributed feedback (DFB) laser structure having two sections, comprising:

an active-material layer for generating a laser light having a wavelength in a specific range;

two cladding layers respectively covering an upper and a bottom sides of said active-material layer for forming a waveguide structure;

a sampled grating layer having a specific period for determining a lasing wavelength, and

a wet-etching stop layer cooperating with said sampled grating layer for controlling a coupling index of said sampled grating layer;

wherein a difference between said two sections is a duty cycle of said sampled grating layer, and a different said duty cycle causes a different effective refractive index for said two sections so as to generate a fixed difference between Bragg wavelengths of said two sections.

20. (Original) The laser structure according to claim 19 wherein said laser is fabricated on a same wafer.

21. (Original) The laser structure according to claim 19 wherein said active-material layer and said two cladding layers are formed through a single expitaxial growth step.

22. (Original) The laser structure according to claim 19 wherein said active-material is a multiple quantum well (MQW) layer.

23. (Original) The laser structure according to claim 19 wherein said two cladding layers are separate confinement heterostructure layers.

24. (Original) The laser structure according to claim 19 wherein said sampled grating layer is formed on said laser by cooperating a single holographic exposure with a dry etching or a wet etching.

25. (Canceled)

26. (Currently amended) The laser structure according to claims 24~~-25~~ wherein said ~~we-etching~~ wet-etching stop layer is positioned between said active-material layer and said sampled grating layer for facilitating said wet etching.

27. (Original) The laser structure according to claim 19 wherein said duty cycle of said sampled grating layer is a proportion occupied by a grating in a sampling period.

28. (Original) The laser structure according to claim 19 wherein said different duty cycle for said two sections changes the effective distributed feedback value thereof and cooperates with specific lengths of said two sections for causing different refractance of said two sections so as to have an identical effect to a structural asymmetry.

29. (Original) The laser structure according to claim 19 wherein when said fixed difference becomes larger, a structural asymmetry becomes bigger so as to facilitate a mode-selection.

30. (Original) The laser structure according to claim 19 wherein said two sections have different sampling periods.

31. (Original) The laser structure according to claim 19 wherein said duty cycle of said sampled grating layer on one of said two sections is 100%, which is a continuous grating layer.

32. (Original) The laser structure according to claim 19 wherein said laser structure comprises plural sections with different sampling periods combined at an arbitrary sequence.

33. (Original) The laser structure according to claim 19 wherein said laser structure comprises plural sections with different duty cycles combined at an arbitrary sequence.

34. (Original) The laser structure according to claim 19 wherein said duty cycle of said sampled grating layer is gradually decreased or increased from one end of said laser structure to the other end thereof.

35. (Original) The laser structure according to claim 19 wherein said two sections are made of laser materials which are fabricated through a selective area growth technique for causing a slight difference of said laser materials of said two sections so as to obtain said fixed difference.

36. (Original) The laser structure according to claim 19 wherein said two sections are made of laser materials which are altered by a quantum well intermixing after an expitaxy of said active material for causing a slight difference of said laser materials of said two sections so as to obtain said fixed difference.

37. (Currently amended) A multi-wavelength distributed feedback (DFB) laser array, wherein each element of said laser array has two sections at a longitudinal structure, comprising:

an active-material layer for generating a laser having a wavelength in a specific range;

two cladding layers respectively covering an upper and a bottom sides of said active-material layer for forming a waveguide structure;

a phase shift layer having a specific thickness for controlling a difference between Bragg wavelengths of said two sections;

a sampled grating layer having a specific grating period and a specific sampling period for determining an illuminating wavelength;

a wet-etching stop layer positioned between said active-material layer and said ~~phase shift~~ sampled grating layer; and

another wet-etching stop layer positioned between said phase shift layer and said sampled grating layer,

~~a sampled grating layer having a specific grating period and a specific sampling period for determining an illuminating wavelength,~~

wherein a difference between said two sections is an existence of said phase shift layer thereon, said existence of said phase shift layer causes a difference of the effective refractive indices between said two sections so as to generate a fixed difference between Bragg wavelengths of said two sections, and because said sampling period of said each laser element is different, the peak of reflection spectrum of each laser element is aligned to different positions so as to output different wavelengths, and said fixed difference between Bragg wavelengths of said two sections of a laser element in said laser array is for controlling said laser element to emit light at an aligned reflection peak, wherein a length ratio of said two sections is adjusted so that said each laser element illuminates at a long wavelength mode or a short wavelength mode of said reflection peak.

38. (Original) The laser array according to claim 37 wherein said laser array is fabricated on a same wafer.

39. (Original) The laser array according to claim 37 wherein said active-material layer and said two cladding layers are formed through a single expitaxial growth step.

40. (Original) The laser array according to claim 37 wherein said sampled grating layer is formed on said laser by cooperating a single holographic exposure with a dry etching or a wet etching.

41. (Original) The laser array according to claim 37, wherein said sampled grating layer has a reflection spectrum with plural equidistant peaks whose center peak is aligned to Bragg wavelength and said two sections have different said sampling periods so as to obtain a reflection peak difference ΔP.

42. (Original) The laser array according to claim 41, wherein said specific thickness of said phase shift layer is properly formed so that said fixed difference of Bragg wavelengths of said two sections is approximately equal to said ΔP plus a fixed wavelength so as to cause said reflection spectrums of said two sections to be approximately aligned at the first peak thereof, a length ratio of said two sections is adjusted so that said each laser element illuminates in an aligned reflection spectrum at a long wavelength mode or a short wavelength mode for forming a single-wavelength output, and then said sampling period of said each laser element in said laser array is formed to be different from one another for aligning said reflection spectrum of said each laser to different locations so that said each laser element outputs different wavelengths.

43. (Canceled)

44. (Original) The laser array according to claim 41, wherein said grating of said each laser element is one of a loss coupled grating, a gain coupled grating, and a complex-coupled grating for generating a single-wavelength output, said specific thickness of said shift layer is formed so that said fixed difference of Bragg wavelengths of said two sections is approximately

equal to said ΔP plus a fixed wavelength so as to cause said reflection spectrums of said two sections to be approximately aligned at the first peak thereof, and said two sections have an identical length thereof.

45. (Canceled)